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ABSTRACT

This guide contains a proposed curriculum for an introductory secondary and postsecondary course in electronic publishing. The course is designed to allow students to develop technical competence and knowledge in a real-life, practical environment that fosters the development of problem-solving, decision-making, and creativity. The teacher functions primarily as a facilitator of learning and a resource person. The guide is divided into three parts. The first part consists of a brief discussion of how and why the curriculum was developed. It covers student evaluation, preparing to use the curriculum, and laboratory configuration. The second part is a curriculum guide that describes in detail the content and suggested instructional activities to introduce students to electronic publishing. It includes a course description, course content outline, list of intended learning outcomes, and activity plans including objectives and daily lesson outlines. The 12 activity topics are as follows: assemble and maintain computer system, making art, design and produce a business card, letterhead and envelope, introduction to word processing, brochures, two problem-solving activities, newsletters, electronic publishing with word processing software, newspaper advertisements, and career exploration. The third part is a resource guide that lists 32 books, 14 journals and magazines, 12 professional and trade organizations, computer hardware, and software. (YLB)

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DO-IT-YOURSELF PRINTING: AN INTRODUCTION TO ELECTRONIC PUBLISHING

CURRICULUM AND RESOURCE GUIDE

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Preface

This guide contains a proposed curriculum for an introductory course in electronic publishing. It was written during the summer of 1990 to provide secondary and post-secondary educators with an introductory electronic publishing curriculum. It is also an example of a curriculum designed according to a synthesized approach to curriculum development developed by the author.

Primarily curriculum development can be grouped into two classes; technical and naturalistic (Finch and Crunkilton, 1989). The technical methods involve a scientific approach such as task analysis and Developing a Curriculum (DACUM). The naturalistic methods include philosophic and introspective approaches. Basically, the two types differ in the way the content is determined. The technical approaches depend on experts from a particular field whereas the naturalistic approaches advocate allowing the developer to determine the content.

As would be expected, there are critics of both approaches. Critics of the technical approaches argue that the process is expensive, slow to respond to changes in the workforce, difficult to accomplish, and tends to focus on lower-level skills and occupations verses more cognitive occupations. Whereas the naturalistic approaches are simpler, less costly, more responsive to change, critics contend that these techniques are less accurate, afford a lower degree of accountability, and are constrained by the subject-matter expertise of the developer. The author of this curriculum contends that an approach that synthesizes the strengths of the technical and naturalistic approaches will alleviate many, if not all, of the weakness of each approach when used exclusively.

The approach taken to develop this course is a modification of the course design method offered by Posner and Rudnitsky (1989). The modifications were based upon the author's personal experience, the findings of cognitive psychology regarding thinking, learning, and skills acquisition, and the writings of John Dewey (1915, 1938) and William Glasser (1969).

This course is designed to allow students to develop technical competence and knowledge in a real-life, practical environment that fosters the development of problem-solving, decision-making, and creativity. In addition, the course is designed to allow the students to exercise a great deal of control over their learning. The teacher primarily functions as a facilitator of learning and a resource person. The teacher uses his/her experience to guide the learners (Dewey, 1938).

This guide is divided into three parts. The first part consists of a brief discussion of how the curriculum was developed and why it was developed that way. In this section, the discussion begun here will be continued. The second part is a curriculum guide, which describes in detail the content and suggested instructional activities to introduce students to electronic publishing. The third part is a resource guide. This portion will provide the teacher with several handouts and worksheets, and a listing of textbooks and other instructional materials, journals and magazines, professional and trade organizations, computer hardware, and software.

To successfully use this curriculum as written, it will be important to ensure the following:

- Access to an adequate number of computers and word processing, graphics, and electronic publishing software.
- The administration's support to work with members of the community.
- The teacher is or can become comfortable with allowing the students to be responsible for a large portion of their own learning.

Guiding Principles

The following statements guided the development of this curriculum:

1. The course should have an experiential focus. In other words, activities will be used to develop interest in the subject, provide reason for learning the associated information, and facilitate skill development (For additional information regarding this approach see the educational works of John Dewey).
2. The use of the lecture method of instruction was limited in keeping with the experiential focus. Information will be transmitted in a more natural manner (i.e., via exploration and research) as it is needed by the students to accomplish particular tasks.
3. The curriculum should focus on developing competencies within a problem solving environment. In other words, students will increase knowledge and develop skills, and will apply that knowledge and their skills to solve structured and unstructured problems.
4. The following sequence was used to organize the learning activities: exploration (to develop interest and excitement), guided practice, independent practice on structured problems (i.e., problems with a specific solution), and independent practice on unstructured problems (i.e., problems with a number of possible solutions).
5. The curriculum was developed to allow the use of any software and hardware configuration.
6. The curriculum should be interdisciplinary in nature. That is, mathematic, reading, and writing instruction and practice should be an integral part of the curriculum.
7. The curriculum should support partnerships between the schools and business and industry.

How to Use This Guide

This curriculum is centered around a series of practical activities that gives the students opportunities to learn about electronic publishing and prepress design techniques while developing technical skills. Although the curriculum does prescribe the activities to be completed, the teacher is encouraged to use a variety of instructional techniques. If not already, teachers should become familiar with the text entitled, *Models of Instruction* by Joyce and Weil.

Student Evaluation

The author of this curriculum takes the position that the students should be expected to master the content and skills presented in this course. Teachers should use a variety of instructional methods to ensure that the students master the material. Mastery should be verified via diverse methods as well.

In the case of skill development, student performance should be concerned with products (i.e., what is developed) and process (i.e., how it is developed) and be determined by direct observation. Teachers may wish to develop a checklist for each skill to be mastered, however, teachers should be aware that checklists have the tendency to limit the student's creativity by focusing on a single approach to completing a task or solving a problem. A better alternative would be for the teacher to take daily notes on the progress of each student. Throughout this course the teacher will serve primarily as a facilitator of learning. In this capacity the teacher will have ample opportunity to observe students, verify skill acquisition, and identify and remediate problems.

Knowledge acquisition can be verified through the review of homework assignments and research papers, tests and quizzes (written and oral), and oral presentations. Ideally students would be required to pass all written evaluations with a score of at least 80%. If the students do not achieve this score, they should be given an opportunity to retake the examination after a period of remediation. Homework assignments and oral quizzes may be graded, however, it would probably be more productive to use these devices to check the students' understanding of the material.

Preparing to use this curriculum

In order to use this curriculum guide the teacher will need to do the following:

1. Assemble a resource library that contains textbooks, periodicals, technical manuals, and so forth. A resource library will allow the students to research the information for themselves verses having it "spoon-fed" via a single, general textbook.
2. Develop needed handouts, and worksheets.
3. Determine how grades will be calculated.
4. Develop a syllabus to give to the students. A syllabus should be given at the beginning of the course so that the students have a clear understanding of what to expect. The teacher can also use this tool to begin the process of making the students partially (or mostly) responsible for their learning. As a minimum, the syllabus should have the following information: general information about the course, course description, intended learning outcomes, instructional activities, and grading information.
5. Develop tests, quizzes, and performance evaluations.
6. Determine what knowledge instruction is needed and the instructional methods to be used. Course content should be presented "naturally" as a result

of working with the material. In most cases the students should be instructed to locate the information for themselves. However, the teacher may desire to use individual readings, discussions, brief lectures, students presentation, and other instructional methods to ensure that the content is mastered.

NOTE: As the student's develop skills and learn new techniques on their own, it will be very valuable for them to make presentations to the class. In addition, the teacher should encourage the students to share ideas and techniques with each other.

7. Add homework assignments where needed. Be sure to assign work that the students are capable of doing without the teacher's assistance so that students do not practice mistakes. Homework assignments are best used to review material, introduce content that will be discussed the next day, and practice skills that have been mastered.
8. Require that the students keep a notebook (journal) and portfolio during this course. The notebook will be used daily to record the students research findings, descriptions of the materials they produce, their personal reactions to class activities, and so forth. The notebooks will provide the students an opportunity to review the material they have covered and to practice their writing skills. The portfolio will be used by the students to store and display the products they develop during the course. Encourage the students to be creative in designing their notebooks and portfolios.
9. With the student's help, secure examples of professionally designed materials and page makeovers (see *Publish* magazine).
10. To add additional relevance and excitement to the course, the teacher could locate state and national design contests for the students to enter. If a contest cannot be found, perhaps a local contest can be arranged.

Laboratory Configuration

1. The curriculum was developed to allow the teacher to use the computer systems and software available to them. This author recommends an Apple Macintosh computer system (Model SE30 and above) equipped with 2 Mb of RAM, a 20 Mb harddisk, and an extended keyboard. In addition the author recommends Microsoft Word 4.0 (word processing), PageMaker 3.0 (electronic publishing), Deneba Canvas 2.0 software. However, many teachers will not have access to this hardware and software and should adapt the materials to fit the hardware and software configuration they have. The curriculum is flexible enough to accommodate almost any hardware and software configuration.
2. Ideally, the laboratory will be equipped with enough computers to allow students to work in teams of two. The laboratory should also have at least one laser printer and several dot matrix printers which will be connected to more than one computer via a selection box. Finally, the laboratory should have at least one scanner and the appropriate software for scanning graphics (Text recognition (OCR) software is considered an unnecessary luxury). It is possible to teach this course with less hardware and software, however, the quality of the program and the amount that can be covered will be affected.

Title: Do-It-Yourself Printing: An Introduction to Electronic Publishing (Microcomputer).

Course Description: This course is an introduction to electronic publishing (EP) using microcomputer systems. The course is designed to provide the student with a basic understanding of EP, its uses and limitations, and technical competence with one EP software package. The students will be taught through a series of practical, hands-on experiences designed to develop skill with the software, the ability to apply accepted design techniques, and to develop the ability to solve problems that commercial printers and graphic artists commonly encounter.

Course Length: One semester

Target Audience: This curriculum is designed for upper-level high school (grades 11 and 12) and post-secondary students as an introduction to electronic publishing. It is most appropriate for students in graphic arts, business, and journalism programs, however, other students may benefit from completing this course (e.g., students involved in producing the school's newspaper and yearbook may be interested). Ideally, the students will have had some experience with microcomputers, are able to type, and are familiar with one word processing package. Those who are not will have greater difficulty completing this curriculum, but it will not be impossible for them to complete the course.

Course Content Outline:

I. Introduction to Electronic Publishing
   A. What is electronic publishing?
   B. Common uses for electronic publishing

II. Electronic publishing system components
   A. Hardware
      1. Input devices
         a. Mouse
         b. Keyboard
         c. Digitizer
         d. Scanner
      2. Computer systems
         a. Macintosh systems
         b. IBM & IBM compatible systems
         c. Capacity needs and availability
         d. Storage devices and capacity
         e. Speed of systems
      3. Output devices
         a. Dot matrix
         b. Laser
         c. Electronic typesetters
         d. Printing services
         e. Paper quality and selection
   B. Software
      1. Word processing
      2. Draw/Paint
      3. Graphic enhancement
      4. Electronic Publishing (page layout)

5. Integrated software (e.g., Microsoft Works)

III. Electronic publishing software operation
- A. Cut/Move
- B. Copy
- C. Delete
- D. Paste
- E. Print
- F. Save
- G. Import (Place)
- H. Export
- I. Text formating
- J. Graphics enhancement
- K. Layout tools
- L. Pasteboard or workarea
- M. Keyboard shortcuts

IV. Project planning & scheduling
- A. Background research
- B. Style planning
- C. Production planning

V. Working with text
- A. Text editing
  1. Spelling checkers
  2. Grammar checkers
  3. Copyfitting
- B. Rules for editing
- C. Editorial markings
- D. Typesetting
  1. Fonts, font size, and type face
  2. Drop caps or storybook first letter
  3. Leading and kerning (tracking)
  4. Reverse type
  5. Hyphenation

VI. Working with graphics
- A. Importing formats
- B. Graphic capabilities of software
  1. Word processing
  2. Electronic publishing
- C. Selecting appropriate graphics
- D. Altering graphics
  1. Cropping
  2. Resizing
  3. Rotating
  4. Distorting
- E. Halftones
- F. Greyscales

VII. Page layout
- A. Design techniques
  1. Use of white space
  2. Blocking

3. Creativity
4. Purpose
5. Audience
6. Borrowing ideas

B. Layout tools
1. Grids
2. Master pages
3. Style sheets
4. Tagged paragraphs (?)
5. Guidelines

C. Flowing (placing) text
D. Text Wrap
E. Distorting text
F. Bullets and hanging paragraphs
G. Thumbnails or preview mode
H. Color separation

VIII. Production of products
IX. Career Opportunities

Intended Learning Outcomes:

1. The student will be able to describe electronic publishing (EP) and the common uses of this technology within the graphic arts field.
2. The student will be able to use EP, graphic arts, and computer terms accurately.
3. The student will be able to identify when to use EP, when to use conventional techniques, and when to use a combination.
4. The student will be able to identify and describe the function of the components of a microcomputer EP system.
5. The student will be able to set up and operate a microcomputer EP system using appropriate software.
6. The student will be able to apply commonly accepted design principles to layout printed materials.
7. The student will be able to plan, schedule, and manage the production of printed materials.
8. The student will be able to operate a popular, commercial EP software package to produce a wide variety of printed materials.
9. The student will be able to write, edit, and typeset text using a word processing and EP programs.
10. The student will be able to develop or modify a variety of graphics for use in electronically published materials.
11. The student will be able to operate a scanner and the associated software (graphic and text).
12. The student will learn to work cooperatively as a member of a design and production team.

13. The student will develop confidence in his/her ability.
14. The student, when presented with a novel situation requiring the creation of printed materials, will be able to determine what materials are needed, design those materials, and produce them.
15. The student will have an understanding of the career opportunities for an individual with EP training.
16. Working in a team, the student will learn to market printed products to a potential customer.

Central Questions:

1. How is EP done using a microcomputer system?
2. When is it appropriate to use EP instead of conventional means?
3. How does one design quality printed materials?
4. What are the possible uses of EP?

Suggested Learning Activities:

1.	Assembly and maintenance of computer system	(2 days)
2.	Make art objects	(2 weeks)
3.	Design and produce a business card	(1 week)
4.	Design and produce a letterhead and envelope	(1 week)
5.	Introduction to word processing	(3 days)
6.	Design and produce a brochure	(2 weeks)
7.	Problem-solving activity #1	(1 week)
8.	Design and produce a newsletter or newspaper	(2 weeks)
9.	Electronic publishing with word processing software	(1 week)
10.	Design and produce a newspaper advertisement	(1 week)
11.	Problem-solving activity #2	(4 weeks)
12.	Career exploration	(1 week)

ACTIVITY PLANS
INCLUDING
DAILY LESSON OUTLINES

ACTIVITY I — ASSEMBLE & MAINTAIN COMPUTER SYSTEM (2 DAYS)

Objectives — Upon completing this activity, the students will able to:

- Assemble a microcomputer system (i.e., computer,monitor, keyboard, mouse, printer, cables, and disk drives).
- Identify and explain the function of the major components of the computer system.
- Understand and use basic computer terminology appropriately.
- Perform routine maintenance according to the owner's manual instructions.

Day 1 — Assemble computer system

1. Distribute a handout that contains (a) information about the names and functions of the various components in the computer system, (b) basic computer terminology, and (c) safety instructions regarding the assembly process.
2. Distribute owner's manuals provided with the computers being used. As an alternative, copy the needed parts of the owner's manual.
3. Assign students to teams (ideally there would be no more than 2 students per computer system).
4. Instruct students to assemble the computer system according to the information in the owner's manual.
5. Teacher circulates around the room to assist students as needed.
6. When students have completed assembly, the teacher should inspect students work. The teacher may wish to develop a checklist by listing the key steps identified in the owner's manual. The checklist can be used to evaluate the student's performance.
7. Instruct students to "boot up" the computer system.
8. Instruct students to perform the self-check on the computer and printer.
9. Instruct students to record any discrepancies.

Day 2 — Maintain computer system (Teacher and student-directed learning).

1. Using the owner's manual and other instructional materials and providing the necessary tools, have the students perform routine maintenance (mostly cleaning).
2. Using either a worksheet, quiz, or classroom discussion, review the names and functions of all components in the computer system.
3. Using either a worksheet, quiz, or classroom discussion, review computer terminology.

ACTIVITY II — MAKING ART (2 WEEKS)

Objectives — Upon completing this section, the students will able to:

- State the basic functions of draw/paint programs.
- Operate a microcomputer using a draw/paint program in each of its modes, an EP program, and a scanning interface program for the purpose of making illustrations and so forth.
- Operate a scanner.
- Decide when it is appropriate to use the draw or paint portions of the program.
- Describe the generic problem solving model.
- Apply the generic problem solving model to various problems.
- Describe and use basic design principles.
- Design, create, save, and print various graphic objects using a draw/paint program, an EP software program, and a scanner.

Day 1 & 2 — Introduction to a draw/paint program and scanners (Teacher-directed learning).

1. Organize the computer laboratory so that there are no more than two students per computer.

NOTE: When students are working in teams, it is important they rotate often so that both students have plenty of opportunity to develop expertise.

2. Display examples and briefly describe the various types of graphics used in EP.
3. Briefly discuss the uses of a scanner, and demonstrate how to operate a scanner.
4. Distribute a worksheet that the students will use to learn how to operate the scanner.
5. Pass around a schedule for the students to sign-up to use the scanner.
6. Briefly describe the functions of a draw/paint program.

NOTE: Review the basic components of the computer system with the students.

7. Talk the students through the steps of creating a simple art object using the draw then paint portions of the program, ensuring that the students understand the different applications of both modes of the program.
8. Demonstrate and discuss commercial and public domain clip art (electronic and hardcopy).

Days 3 & 4 — Create arts objects (Student-directed learning).

1. In this activity the students are to create, modify, save, and print art objects of their own design. The teacher acts as a facilitator and troubleshooter.

2. Encourage the students to be creative and to enjoy themselves.
3. Provide the students with a handout which discusses design principles related to illustrations and other graphics.
4. Have the students save the art objects on their datadisk and a paper copy in their portfolio (notebook).
5. Have the students explain their art objects in their notebooks. What does the object represent? What effect was the student trying to create? Why did the student choose particular objects, shades, etc.? How could the art objects be used in the creation of printed materials.
6. Teacher and students should evaluate the art objects. During this process have the students read the descriptions of their art objects which they they wrote in their notebooks.

Days 5 & 6 — Create a logo (Teacher and student-directed learning).

1. Display examples of corporate logos.
2. Discuss the purpose of a logo.
3. Discuss the generic problem-solving model (i.e., state the problem, understand the problem, brainstorm solutions, evaluate solutions, select best solution, implement solution, evaluate results) and discuss how that model can be applied to this activity and the activities to follow.

NOTE: The teacher should plan to have the students use this model as often as possible to provide them with adequate practice to ensure mastery and the ability to apply the model to novel situations. The teacher should have the students record the steps in their notebooks for each problem they solve.

4. (Alternative 1) Using pencil and paper, have the students do rough sketches of possible logos.
4. (Alternative 2) Using the draw/paint program, have the students do rough sketches of possible logos.
5. As the teacher examines the student's rough drafts discuss relevant design principles. Refer the students to the handout they were provided earlier and the text library for additional information.
6. (Alternative 1) As the students complete their rough drafts, the teacher should help students evaluate them to decide which one to produce.
6. (Alternative 2) Teacher allows students to evaluate each others' rough drafts to decide which one to produce.
7. Using the draw/paint program, have students produce the logo. Save the logo on their datadisks and a paper copy in their notebooks.

Days 7 — Modifying a scanned drawing using the draw/paint program (Teacher and student-directed learning).

1. Talk the students through the steps to open the scanned drawing using the draw/paint programs.
2. Demonstrate how changes can be made to the drawing.
3. Have the students alter a drawing according to their taste.

Days 8 & 9 — Explore the graphic capabilities of the EP program (Teacher and student-directed learning).

1. Briefly describe the graphics capabilities of the EP software.
2. Talk the students through the steps to open the EP software.
3. Talk the students through the basic graphic functions.

NOTE: Be sure to identify how the draw/paint and EP programs are similar.

4. Allow the students to "make art."
5. Introduce the students to the concept "place" by talking them through the steps to place their logo in a new document.
6. Allow students to practice placing illustrations using those provided with the EP software.
7. Talk the students through the various functions of the EP software related to the modification of illustrations.
8. Allow students to practice modifying illustrations.

Day 10 — Explore the graphic capabilities of the word processing (WP) program being used; review and evaluation (Teacher-directed learning).

1. Talk the students through the steps to place a graphic into a document created using the word processing software.
2. If possible, talk the students through the various functions of the WP software related to the modification of graphics.
3. If necessary, allow them to practice placing and modifying graphics.
4. Review concepts and procedures.
5. Conduct student evaluation.
6. Suggest that the students read in the text about fonts, font faces, and design principles. Develop and provide a handout if necessary.

ACTIVITY III — DESIGN & PRODUCE A BUSINESS CARD (1 WEEK)

Objectives — Upon completing this section, the students will able to:

- Type, cut, copy, paste, and format text in the text mode of the EP software.
- Identify various fonts and font faces.
- Design business cards according to commonly accepted design principles.
- Use a printer's template to measure fonts and lines.
- Describe the purpose and types of business cards.
- Apply the generic problem solving model to produce a business card.
- Create and evaluate rough drafts of business cards.
- Design, create, save, and print a master sheet of business cards.
- Place cutting lines on the master sheet.

Day 1 — Introduction and production management (Teacher-directed learning).

NOTE: Steps 1 and 2 can be omitted at this point and included in discussion sessions while the students are working on the business cards.

1. Display various fonts and font faces using the overhead or posters and discuss the variety of type faces available and how fonts are used to produce various effects.
2. Provide the students with a handout covering fonts and font faces or draw their attention to the section in their text that discusses the types and effective uses of fonts and font faces; suggest they read this section for homework. Remind the students that they will have difficulty completing future assignments without an understanding of fonts and typography.
3. Discuss the need for project planning and scheduling to ensure timely completion. If possible, point out where this information is in the text.
4. Display and discuss how printed materials (e.g., a newspaper, brochure, etc.) are planned and scheduled.
5. Display and discuss various forms that have been designed to facilitate the planning and scheduling processes.
6. Provide the students with copies of the planning and scheduling forms.
7. Ask the students to find examples of real business cards in the community and bring them to class for tomorrow.

Day 2 — Designing business cards (Teacher and student-directed learning).

1. Display business cards that the students and teacher brought to class.
2. Discuss the function of business cards in the United States and other countries.
3. Ask the students to examine the examples of business cards and to select three that they believe to be the best.

4. Point out to the students how business cards differ according to profession. Ask them to speculate why.
5. Based on the results of step three, determine the top six business cards preferred by the students. Ask the students to explain why they were chosen.
6. Briefly discuss relevant design principles.
7. Using the generic problem solving model, have the students create rough drafts of a business card and select one for production.
8. Provide the students with a handout that summarizes the most commonly used editorial markings. Instruct the students to use these marking when editing copy (text).

Day 3 & 4 — Produce business card master (Student-directed learning).

1. Discuss how a commercial printer would produce business cards.
2. Display and discuss a master sheet of business cards which would be used to make the printing plate.
3. Instruct the students to produce a master sheet of their business card using the electronic publishing software; have the students include the cut lines on the master.

NOTE: It may be necessary to review the operations of the electronic publishing software.

4. (Alternative #1) Using a copy machine and 60# card stock (if your machine will handle that weight), have the students produce 5 sheets of their business card.

4. (Alternative #2) Using an offset printer to produce 5 sheets of each business card.

5. Instruct the students to cut the master sheets into individual business cards.

Day 5 — Evaluating business cards (Teacher and student-directed learning).

1. Using an evaluation form have the students evaluate each other' business cards.

NOTE: If possible the teacher may wish to bring in people from the school and community to judge the students' work (e.g., local printers, other teachers, parents).

2. Review the design principles applicable to designing business cards.
3. Evaluate the student's knowledge through discussion session or written examination.

ACTIVITY IV — LETTERHEAD & ENVELOPE (1 WEEK)

Objectives — Upon completing this section, the students will able to:

- Apply design principles to the development of letterheads and envelopes.
- Apply the generic problem solving model to produce a letterhead and envelope.
- Produce envelopes and letterhead using graphic and electronic publishing software programs.
- Describe the importance of a company's image as projected by the printed materials they use.
- Evaluate the effectiveness, attractiveness and appropriateness of the letterheads and envelopes developed by their classmates.

Day 1 & 2 — Introduction and design letterhead & envelopes (Teacher & student-directed learning).

1. Review the design principles which are applicable to this activity. Provide handout if needed.
2. Discuss with the students the importance of a company's image and the impact of printed materials on that image. Perhaps a guest speaker would be appropriate for this discussion.
3. Allow the students to evaluate samples of letterhead and envelopes gathered from a variety of sources (e.g., commercial printers, companies in the community, and the school district).

NOTE: *Allow the students to use an evaluation sheet to evaluate designs.*

4. Instruct the students to write out which designs they liked the best and to explain why they chose those particular designs.
5. Using the generic problem solving model, instruct the students to develop rough drafts of letterheads and envelopes, and select the best one for production.

NOTE: *Allow students to assist one another in evaluating designs. The teacher should assume the role of a team member, not the final judge.*

6. Instruct the students to complete the necessary scheduling and planning documents for this project.

Day 3 & 4 — Produce letterhead & envelopes (Student-directed learning).

NOTE: *At this point the students should be working fairly independently and should be able to apply the techniques they have already learned to produce the letterhead and envelopes. The teacher should act as a facilitator and should work with students to (a) determine their level of learning, (b) provide additional tips and insight, and (c) provide remediation.*

1. Assist the students in determining the appropriate software to use to produce a letterhead and envelope.
2. Allow the students to work in teams.

Day 5 — Evaluate letterhead & envelopes (Student-directed learning).

NOTE: See Activity III, Day 5 for instructions.

ACTIVITY V — INTRODUCTION TO WORD PROCESSING (3 DAYS)

NOTE: This activity is designed to introduce the students to the electronic publishing capabilities of a word processing program. It is not designed to teach students how to type or to become proficient with word processing. Days one and three of this activity may be omitted if the students are already proficient with the word processing software.

Objectives — Upon completing this section, the students will able to:

- Discuss the uses of word processing software.
- Discuss the similarities and differences of word processing and electronic publishing software.
- Use a common word processing software program to type, edit (cut, copy, paste, delete), save, and print text.
- Use a common word processing software program to layout printed material.
- Determine when to electronically publish printed materials using the capabilities of a word processing program.

Day 1 — Introduction (Teacher and student-directed learning).

1. Talk the students through the steps to create, edit, save, and print a document using a common word processing software program.
2. Allow the students to write a letter and print it on the letterhead they developed in the last activity.

Day 2 — Practice (Student-directed learning).

1. Demonstrate the capabilities of the word processing program.
2. Discuss when the word processing software is the most appropriate software choice.
3. Instruct the students to produce a document that has multiple columns, a header, a footer, and multiple font faces.

Day 3 — Practice (Student-directed learning).

1. If necessary, allow the students to complete yesterday's work.
2. Allow students to produce a document of their choice.

ACTIVITY VI — BROCHURES (2 WEEKS)

Objectives — Upon completing this section, the students will able to:

- Apply design principles to brochures.
- Apply the generic problem solving model to produce a brochures.
- Produce a brochures using graphic and electronic publishing software programs.
- Discuss the uses of brochures.
- Evaluate the effectiveness, attractiveness and appropriateness of the brochures developed by their classmates.

Day 1 & 2 — Introduction to designing and producing brochures (Teacher and student-directed learning).

1. Provide the students with examples of well-designed brochures.
2. Discuss the purposes of brochures.

NOTE: Usually electronic publishing software includes a tutorial that contains the text and graphics to produce a brochure. If the software being used does not contain a brochure in the tutorial, the teacher should develop one and save the components of the brochure on a datadisk for student use.

3. (Alternative #1) Instruct the students to complete the tutorial for producing a brochure.
3. (Alternative #2) Give the students step-by-step instructions (either talk them through the stops or give them a handout) for producing the brochure designed by the teacher.

Day 3 & 4 — Prepare to produce brochure (Teacher and student-directed learning).

1. Evaluate examples of commercially-produced brochures based on commonly accepted design principles.
2. Assist the students in deciding the purpose and content of a brochure they will produce in class.

NOTE: If possible and desirable, the students may be given the opportunity to produce brochures for individuals outside the class.

3. Instruct the students to develop the text for the brochure using the word processing software, and the graphics using appropriate hardware and software.
4. Using the generic problem-solving model, assist the students in designing their brochures.
5. Instruct students to complete planning and scheduling documents.
6. Assist students in self and group evaluation.

7. Have the students modify their brochures based on the feedback they receive.

Day 5 - 9 — Produce a brochure (Student-directed learning).

Day 10 — Evaluate the brochure (Student-directed learning).

NOTE: See Activity III, Day 5 for instructions.

ACTIVITY VII — PROBLEM-SOLVING ACTIVITY #1 (1 WEEKS)

Objectives — Upon completing this section, the students will able to:

- Design and produce printed materials to a customer's satisfaction.
- Develop an oral, written, and visual presentation for the customer (marketing).
- Determine the cost of services and products rendered to a customer.
- Apply the generic problem-solving model.
- Discuss the various aspects of a commercial printing business.

Days 1 - 5 — Simulation exercise (Student-directed learning)

NOTE: For this exercise, it may be best to organize the students into teams of 4-6 students and to simulate a commercial printing operation or an in-house printshop. In addition, the students may need to visit a local grocery store to determine their printing needs.

1. The student role play working as a commercial printer. A customer has just come into the shop. The customer explains that she is starting a new grocery store and needs to order printed supplies (i.e., letterhead, envelopes, notepads, and an employees' schedule form).
2. Teams design the recommended products. When finished have the teams present their ideas to the client and receive feedback and approval.

NOTE: Teacher can serve as the client for this step unless he/she wishes to bring in someone from the community.

3. Teams plan production and produce the products.
4. Evaluation of the products should be conducted by the teacher of by someone outside the class. During this time have the students sit in a circle and discuss what they learned during this activity and how they feel about it. The teacher should strive to help the students feel positive about the experience and about their performance.

ACTIVITY VIII — NEWSLETTERS (2 WEEKS)

Objectives — Upon completing this section, the students will able to:

- Apply design principles to producing newsletters.
- Apply the generic problem solving model to produce a newsletter.
- Produce a newsletter using graphic and electronic publishing software programs.
- Discuss the uses of newsletters.
- Evaluate the effectiveness, attractiveness and appropriateness of the newsletters developed by their classmates.

Day 1 — Introduction to newsletters (Teacher-directed learning).

1. Provide the students with examples of commercially developed newsletters to point out the purpose and popularity of newsletters, and to identify what makes a quality newsletter (Handout may be desirable).
2. Allow the students an opportunity to evaluate the commercially developed newsletters based on commonly accepted design principles.
3. Provide the students with examples of poorly designed newsletters. Discuss with the students what makes these newsletters bad.
4. Ask the students to select a poor newsletter to redesign as homework.

Day 2 - 4 — Produce tutorial newsletter (Teacher-directed learning).

1. Allow the students time to evaluate each others remakes of the poor newsletters.
2. Most likely the software package being used contains a newsletter in the tutorial materials. Ask the students to complete that newsletter now. As with the case of the brochure, if a tutorial newsletter is not available, the teacher should develop the needed text and graphics beforehand and have the materials available on a diskette.

NOTE: The teacher should provide technical assistance at this time. Also the teacher can use this time to quiz individual students about what they have learned, clear up any misconceptions, and reinforce material.

3. Evaluate products (either teacher-led or if time permits allow the students to evaluate each others work.

Day 5 - 9 — Students produce newsletters (Student-directed learning).

1. Using the generic problem-solving model and working as a group, the students and teacher decide on a newsletter project to be complete in the next five days.

NOTE: The teacher and students should decide if (a) all teams will produce the same newsletter, and (b) if the teams will be in competition with one another.

2. Students should be encouraged to work in teams of at least two students.
3. If possible the students could contract to produce a newsletter for someone outside of the class (e.g., a student organization, a teacher or administrator).

NOTE: The teacher should provide technical assistance at this time. Also the teacher can use this time to quiz individual students about what they have learned, clear up any misconceptions, and reinforce material.

4. Students should write the copy for the newsletter, develop or modify graphics, and design the newsletter.
5. After the design has been finalized the students should schedule production and complete the necessary forms.
6. Students should create rough draft, edit the rough draft, complete the final draft, and print a copy of the newsletter.

Day 10 — Evaluation and review (Teacher-directed learning).

1. Students evaluate each others' newsletters using an evaluation form provided by the teacher.
2. Students should be quizzed regarding related knowledge.
3. Students should be asked to share any design or production techniques they found particularly helpful in the production of their newsletter. They should also be encouraged to describe shortcuts and novel techniques that were discovered.

NOTE: Throughout the course the teacher should encourage peer tutoring and the sharing of ideas.

ACTIVITY IX — EP WITH W. P. SOFTWARE (1 WEEKS)

Objectives — Upon completing this section, the students will able to:

- Utilize word processing software when appropriate to electronically publish printed materials.
- Describe when word processing software is preferred over electronic publishing software.
- Utilize word processing software to electronically publish problems.

Day 1 — Step-by-Step Instructions (Teacher-directed learning).

1. Display examples of printed materials that are commonly developed using a word processor.
2. Discuss when the word processor is the appropriate electronic publishing tool.
3. Talk the students through the following functions: making columns; establishing sections which have different formats; importing graphics (if possible); formating characters, lines, and paragraphs; using style sheets (if possible)

Day 2 — Guided Practice (Student-directed learning).

NOTE: Have the students work in teams of two.

1. Present the students with a worksheet which instructs them to create a newsletter or some other printed document using the word processing software and a text file that is already on a disk.

NOTE: Teacher acts as a facilitator and checks the students' understanding of the material being practiced.

2. Have the students evaluate each others work.

Days 3 - 4 — Independent Practice (Student-directed learning).

1. Students produce a document of their choice using the word processing and graphic software.
2. Encourage the students to produce documents that are useful to them.

NOTE: The teacher may wish to conduct a style contest for this exercise.

Day 5 — Review and Evaluation (Teacher-directed learning).

1. Have the students evaluate each others work. If a contest is underway, have the judges evaluate the entries and declare the winners.
2. Review the electronic publishing capabilities of the word processing software.

3. If time permits, quiz the students on the material covered during this activity.

ACTIVITY X — NEWSPAPER ADVERTISEMENTS (1 WEEKS)

Objectives — Upon completing this section, the students will able to:

- Understand and discuss the purpose and importance of newspaper advertisements.
- Design newspaper advertisements according to industry standards and accepted advertising techniques.
- Produce a newspaper advertisement.
- Discuss the various aspects of a career in advertising.

Day 1 — Tour a newspaper or advertising agency (Teacher-directed learning).

1. The purpose of the tour is to allow the students to gain an understanding of how advertisements are designed and produced.
2. If a tour is not possible, the teacher should arrange to have an outside resource person make a presentation to the students.

Day 2 - 4 — Design and Produce an Advertisement (Student-directed learning).

1. The teacher should instruct the students to select a product to advertise, design an advertisement for that product, and produce the advertisement using design and production techniques already covered.

NOTE: The teacher may want to make arrangements with a local grocery store, other business, or newspaper to prepare one of their weekly advertisements. As an alternative, the teacher may arrange to do actual work for some student organization such as, the school newspaper, yearbook staff.

NOTE: The teacher may wish to conduct a style contest for this exercise as well.

Day 5 — Review and Evaluation (Teacher-directed learning).

1. Have the students evaluate each others work. If a contest is underway, have the judges evaluate the entries and declare the winners.
2. Review the function, importance, design, and production of advertisements.
3. If time permits, quiz the students on the material covered during this activity.

ACTIVITY XI — PROBLEM-SOLVING ACTIVITY #2 (4 WEEKS)

Objectives — Upon completing this section, the student will able to:

- Design and produce printed materials based on customer requests, the needs of a particular situation, and to the satisfaction of the customer.
- Present his/her ideas to a customer.
- Interact as a member of a design/production team.

Possible Problems:

1. Design a campaign for someone running for office (real or simulated).
2. Print all of the materials for a school function (e.g., the prom, school play).
3. Complete work for a non-profit organization (e.g., the YMCA, YWCA, Red Cross, local church, etc.).

NOTE: Whatever problem is selected the students should be required to identify needs, brainstorm solutions, evaluate solutions, design products, schedule production, produce products, evaluate productions, present ideas to client(s).

Day 1 — Getting organized (Teacher and student-directed learning).

1. Teacher describes the upcoming activity.
2. Teacher and students brainstorm possible problems to be addressed.
3. Teacher and students develop working teams.
4. Teacher and students decide which problem(s) on which to work.

NOTE: It may be desirable to have all of the teams working on the same problem. In this way the teams could be placed in competition with each other for the client's business.

NOTE: The teacher should remind the students to make daily entries in their journals. Periodically during this activity, the teacher should plan to have 15-20 minute share-sessions to allow the students to share their reactions to the experiences.

Day 2 — Students meet with client(s).

1. The teacher should arrange for the students to meet with the prospective client(s) to discuss (a) what printed materials are needed, (b) the clients' design concerns, and (c) a timeline.

NOTE: If there is more than one client, the teacher may assign certain teams to be in competition for each of the client's business. For example, if there are four teams of students and two clients, teams one and two could vie for the business of client one, and teams three and four for the business of client two.

2. Students then meet in their respective teams to brainstorms ideas, assign preliminary duties, and set target dates.

Day 3 - 19 — Working in teams, the students determine needs, design products, schedule production, produce products, present products to client, and revises products to satisfy client.

NOTE: (If the students are in competition with one another for the client's business). When the students are ready it will be necessary for the teacher to arrange a second meeting with the client so that the students can make their presentations. Based on the client's choice the students would then work together to produce the final products for the client.

Day 20 — Evaluation of products and student evaluation.

1. Peer evaluation of products.
2. Teacher should discuss with the students their reactions to and feelings about working with real clients.
3. If the teacher desires, a quiz can be completed at this time.

ACTIVITY XII — CAREER EXPLORATION (1 WEEKS)

NOTE: To allow more time for research and interviews, this activity may be assigned before the final week of the course. The teacher may desire to take one day during the previous activity to discuss the research paper.

Objectives — Upon completing this section, the students will able to:

- Describe the breadth and depth of the printing careers.
- Discuss how electronic publishing fits into the printing fields.
- Discuss the opportunities in the printing field.
- Discuss their attitude toward and aptitude for a career in the printing fields.

Day 1 — Tour a commercial printshop.

Day 2 — Tour an in-house printshop.

Day 3 - 4 — Research paper related to careers in the printing profession.

1. Instruct the students to select a career within the printing industry and research it in the library or guidance office.
2. Instruct the students to write a paper on the printing career they have chosen. The paper should include a job description, educational requirements, projected openings, potential earnings, potential promotions (i.e., the career ladder), and the student's reaction to the career after studying it.
3. If possible the students should be encouraged to talk with someone who is currently working in that occupation.

NOTE: During this time and throughout the course (as time allows), the teacher should discuss career aspirations with each student privately.

Day 5 —Student Presentations (Teacher-directed learning).

1. Have the students make an oral summary about the career they researched.
2. Conduct a question and answer period after the presentations.
3. Teacher should provide the students with feedback on the quality of their presentation and written report.

RESOURCE GUIDE

HANDOUTS AND WORKSHEETS

TRANSPARENCY # 1

GENERIC PROBLEM SOLVING MODEL

- Identify the problem
- Research the problem
- Thoroughly describe the problem
- Brainstorm possible alternatives (solutions)
- Evaluate alternatives
- Select the best alternative
- Implement the alternative
- Evaluate the results

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American Printer, 300 W. Adams Street, Chicago, IL 60606.

Desktop Graphics, Dynamic Graphics, 6000 N. Forest Park Drive, P.O. Box 1901, Peoria, IL 61656-1901. (800) 255-8800.

Graphic Perspective, Ashley House, 176 Wicksteed Avenue, Toronto, Ontario, M4G 2B6 Canada. (416) 422-1446.

Graphics Arts Monthly and *The Printing Industry*, Technical Publishing, 875 Third Avenue, New York, NY 10022. (212) 605-9548. $36.00 per year.

Inside Print, MPE Inc., 125 Elm Street, New Canaan, CT 06840. (203) 972-0761.

Magazine Design and Production, Globecom Publishing Ltd., 4551 West 107th Street #343, Overland, KS 66207.

Personal Publishing, Renegade Publications, Box 390, Itasca, IL 60143.

Printing Impressions, 401 North Broad Street, Philadelphia, PA 19108.

Printing Journal, 2401 Charleston Road, Mountain View, CA 94943.

Processed World, 41 Sutter Street #1829, SanFrancisco, CA 94104. (415) 495-6823.

Publish! PC World Communications, 501 Second Street, #600, San Francisco, CA. 94107. (415) 546-7722.

Publisher's Weekly, R. R. Bowker, 205 East 42nd Street, New York, NY 10017.

Showpage, 1044 Howard Street, San Francisco, CA 94103. (415) 621-8808.

The Futurist, World Future Society, 1916 St. Elmo Avenue, Bethesda, MD 20814. (301) 656-8274.

Professional Organizations

A. B. Dick Company, Education Manager, 5700 W. Touhy Avenue, Chicago, IL 60648.

American Newspaper Publishers Association, 11600 Sunrise Valley Drive, Reston, Virginia, 22090.

Book Manufacturer's Institute, Inc., Box 368, Ringfield, CT, 06877.

Eastman Kodak Company, Graphics Market Division, Rochester, NY, 14650.

Graphic Arts Technical Foundation, Educational Council of the Graphic Arts Industry, 4615 Forbes Avenue, Pittsburgh, PA, 15213, (412) 621-6941.

In-Plant Printing Management, 947 Old York Road, Abington, PA, 19001.

International Prepress Association, 552 W. 167th Street, S. Holland, IL, 60473, (312) 596-5110.

National Association of Printer's and Lithographers, 570 Seventh Avenue, New York, NY, 10018

National Association of Quick Printers, 111 E. Wacker Drive, Suite 600, Chicago, IL, 60601, (312) 644-6610.

Printing Industries of America, 1730 N. Lynn Street, Arlington, Virginia, 22209, (703) 841-8100.

Society of Typographic Arts, 233 E. Ontario, Suite 301, Chicago, IL, 60601, (312) 787-2018.

3-M Company Education Division P. O. Box 33600, St. Paul, MN, 55133.

Hardware and Software Guide

Where to look for your electronic publishing system.

Color Monitors

Apple 13-Inch RGB, $999; **Apple Portrait Display,** $1,698; Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, (408) 9961010. Mac.

ColorMAX 1280, $6,995; **ColorMAX 8/24,** $6,295; Sigma Designs, 46501 Landing Pkwy., Fremont, CA 94538, (415) 770-0100. Mac.

ColorPage 15, $1,595; **ColorPage T16,** $3,595; **ColorPage T19/24,** $8,090; E-Machines, 9305 S.W. Gemini Dr., Beaverton, OR 97005, (800) 3447274. Mac, IBM.

MacSync Color Monitor, $899; **NEC 2A,** $799; **NEC 3D,** $1,049; NEC 4D, $1,799; NEC Technologies, Inc., 1255 Michael Dr., Wood Dale, IL 60191, (708) 860-9500. Mac, IBM.

Radius DirectColor Series; Radius, Inc., 1710 Fortune Dr., SanJose, CA 95131, (408) 4341010. Mac.

RasterOps Color Monitors; RasterOps Corp., 2500 Walsh Ave., Santa Clara, CA 95051, (408) 562-4200. Mac.

SuperMac Color Two-Page Display, $4,799; SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086, (408) 245-2202. Mac.

Viking Trinitron, $5,995; Moniterm Corp., 5740 Green Circle Dr., Minnetonka, MN 55343, (612) 935-4151. Mac.

Color Printers

ColorScript Model 10, $9,995; **ColorScript Model 30,** $15,995; QMS, Inc., 1 Magnum Pass, Mobile, AL 36618, (800) 523-2696, (205) 633-4300. Mac, IBM.

G330, G370, G650 Color Printers; Mitsubishi Electronics, 991 Knox St., Torrance, CA 90502, (800) 556-1234, ext. 54R. Mac, IBM.

NEC ColorMate PS, $9,995; NEC Technologies, Inc., 1255 Michael Dr., Wood Dale, IL 60191, (800) 366-3632. Mac, IBM.

OceColor, $8,990; Oce Graphics USA, Inc., 385 Ravendale Dr., Mountain View, CA 94039, (800) 545-5445, (415) 964 7900. Mac, IBM.

Phaser PX Color Printer, $7,995; Phaser CPS, $12,995; Tektronix, Inc., Graphics Printing Division, Wilsonville, OR 97070, (800) 835-6100. Mac, IBM.

Pixelmaster, $8,495; Howtek, Inc., 21 ParkAve., Hudson, NH 03051, (603) 882-5200. Mac, IBM.

Seiko Color Point PS, Model 4, $6,999; Model 14, $9,999; Seiko Instruments, Inc., 1144 Ringwood Ct., SanJose, CA 95131, (800) 888-0817, ext. 104R, (408) 922-5900. Mac, IBM.

Computers

IBM; IBM Corp., lOlParagon Dr., Montvale, NJ 07645, (800) 426-7257.

Macintosh; Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014, (408) 996-1010.

IBM PC clones are available from a wide variety of sources. These are only a few:

AST Computers, P.O. Box 19658, Irvine, CA 92713, (800) 876-4AST.

Compaq, P.O. Box 692000, Houston, TX 77269-2000, (713) 370-0670.

Dell Computer Corp., 9505 Arboretum Blvd., Austin, TX 78759, (800) 289-1220.

Northgate Computer Systems, 1 Northgate Park, Northgate Pkwy., Eden Prairie, MN 55344, (800) 548-1993.

Zenith, 1000 Milwaukee Ave., Glenview, IL 60025, (708) 6994848.

Draw Software

Canvas 2.1, $299.95; Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122, (800) 622-6827, (305) 5946965. Mac.

GEM Draw Plus, $299; Digital Research, 75 Garden Ct., Monterey, CA 93940, (800) 443-4200. IBM.

MacDraft 2.0, $269; Innovative Data Designs, Inc., 2280-A Bates Ave., Concord, CA 94520, (415) 680-6818. Mac.

MacDraw II 1.1, $399; Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052, (408) 727-8227. Mac.

FLOPPY DRIVES

Daynafile, $650; Dayna Communications, 50 S. Main St., 5th Fl., Salt Lake City, UT 84144, (801) 531-0203. Mac.

Fujitsu 3.5-Inch Drive, $265; Fujitsu America, Inc., 3055 Orchard Dr., SanJose, CA 95134, (800) 626-4686. Mac.

Rapport/Drive 2.4, $295/$495; Kennect Technology, 120-A Albright Way, Los Gatos, CA, 95030, (800) 552-1232. Mac.

TurboFloppy 1.4, $399; Peripheral Land, Inc., 47421 Bayside Pkwy., Fremont, CA 94538, (800) 288-8754. Mac.

Hard Drives

320MB, $4,999; Peripheral Land, Inc., 47421 Bayside Pkwy., Fremont, CA 94538, (800) 288-8754. Mac.

Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, (408) 9961010.

Dataframe, $795 to $3,795; SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086, (408) 245-2202. Mac.

Ehman E-Series; Ehman, Inc., 97 S. Red Willow Rd., Evanston, WY82930, (800) 257-1666, (307) 789-3830. Mac.

M20, 20MB, $347; Mirror Technologies, 2644 Patton Rd., Roseville, MN 55113, (800) 6545294, (612) 633-4450. Mac.

MacinStor; Storage Dimensions, 2145 Hamilton, SanJose, CA 95125, (408) 879-0300. Mac.

Micronet, 20 Mason, Irvine, CA 92718, (714) 837-6033. Mac.

Nova, $649 to $4,899; Microtech International, Inc., 158 Commerce St., East Haven, CT 06512, (800) 325-1895, (203) 468-6223. Mac.

Platinum Series; CMS Enhancements, 1372 Valencia Ave., Tustin, CA 92680, (714) 259-9555.

Rodime Cobra Series; Rodime Systems, Inc., 901 Broken Sound Pkwy. N.W., Boca Raton, FL 33487, (407) 994-5585. Mac.

Tsunami; La Cie Ltd., 19552 S.W. 90th Ct., Tualatin, OR 97062, (800) 999-0143, (503) 691-0771. Mac.

UltraDrive, $549 to $999; GCC Technologies, 580 Winter St., Waltham, MA 02154, (800) 523-2696. Mac.

Illustration Software

Adobe Illustrator 3.0, $495 Mac; **Adobe Illustrator For Windows 1.0,** $495 IBM; Adobe Systems Inc., 1585 Charleston Rd., Mountain View, CA 94039, (800) 344-8335, (415) 9614400.

Artlme 2.0, $595; Digital Research, 75 Garden Ct., Monterey, CA 93940, (800) 443-4200. IBM.

Arts & Letters 3.0, $695; Computer Support Corp., 15926 Midway Rd., Dallas, TX 75244, (214) 661-8960. IBM.

Corel Draw, $595; Corel, 1600 Carling Ave., Suite 190, Ottawa, Ontario, Canada K16 8R7, (613) 728-8200. IBM.

Designer 3.1, $695; Micrografx, Inc., 1303 Arapaho, Richardson, TX 75081, (800) 733-3729, (214) 234-1769. IBM.

FreeHand 2.02, $495; Aldus Corp., 411 First Ave. S., Seattle, WA 98104, (800) 333-2538. Mac.

Image Editing Software

Adobe Photoshop, $895; Adobe Systems Inc., 1585 Charleston Rd., Mountain View, CA 94039, (800) 344-8335, (415) 961-4400. Mac.

Arts & Letters 3.0, $695; Computer Support Corp., 15926 Midway Rd., Dallas, TX 75244, (214) 661-8960. IBM.

Digital Darkroom, $395; Silicon Beach Software, 9770 Carroll Center Rd., SuiteJ, San Diego, CA 92126, (619) 695-6956. Mac.

Enhance, $395; Micro Frontier, 7650 Hickman, Des Moines, IA 50322, (515) 270-8109. Mac.

Gray F/X, $495; Xerox Imaging Systems, 535 Oakmead Pkwy., Sunnyvale, CA 94086, (800) 248-6550. IBM.

ImageStudio 1.5, $495; ColorStudio, $1,995; Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, (800) 343-8973, (201) 845-6100. Mac.

PhotoMac, $795; Avalon Development Group, 1000 Massachusetts Ave., Cambridge, MA 02138, (800) 522-0265. Mac.

Picture Publisher 2.0, $595; Astral Development Co., Londonderry Square, Suite 112, Londonderry, NH 03053, (603) 432-6800. IBM.

Imagesetters

Birmy Graphics Corp., 2244 N.W. 21 Terrace, Miami, FL 33142, (305) 633-3321. Mac, IBM.

Linotronic Imagesetters; Linotype Co., 425 Oser Ave., Hauppauge, NY11788, (800) 633-1900, (416) 567-7111. Mac, IBM.

Monotype, Inc., 2500 Brickvale Dr., Elk Grove, IL 60007, (708) 350-5600. Circle 185 on rapid reply. Mac, IBM.

Optronics, 7 Stuart Rd., Chelmsford, MA 01824, (508) 2561872. Mac, IBM.

ProSet Series; Agfa Compugraphic, 200 Ballardvale St., Wilmington, MA 01887, (800) 227-2780. Mac, IBM.

Series 4000 & 5000; Varityper, 11 Mt. Pleasant Ave., East Hanover, NJ 07936, (800) 631-8134, (201) 887-8000, ext. 999. Mac, IBM.

Laser Printers

Abaton Techmology, a Division of Everex Systems, Inc., 48431 Milmont Dr., Fremont, CA 94538, (415) 683-2226. Mac, IBM.

Agfa P3400 PS, $9,995; Agfa Compugraphic, 200 Ballardvale St., Wilmington, MA 01887, (508) 658-5600. Mac, IBM.

Apple LaserWriter II NT, NTX, Personal NT; Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, (408) 996-1010. Mac, IBM.

Business LaserPrinter, $3,299; **Personal LaserPrinter II, IIS;** GCC Technologies, 580 Winter St., Waltham, MA 02154, (800) 523-2696. Mac, IBM.

Canon U.S.A., Inc., 1 Canon Plaza, Lake Success, NY 11042, (516) 488-6700. Mac, IBM.

Fujitsu RX7100PS, $4,795; Fujitsu America, Inc., 3055 Orchard Dr., SanJose, CA 95134, (800) 626-4686. Mac, IBM.

IBM Personal Page Prmter II Model 30, $4,999; IBM Corp., 101 Paragon Dr., Montvale, NJ 07645, (800) 426-7257. Mac, IBM.

LaserJet III, IIP, IID; Hewlett-Packard Co., 19310 Pruneridge Ave., Cupertino, CA 95014, (800) 752-0900. Mac, IBM.

LaserMAX 1000, $7,995; LaserMAX Systems, 7150 Shady Oak Rd., Eden Prairie, MN 55344, (612) 9449696. Mac.

MicroLaser, $2,499; Texas Instruments, P.O. Box 202230, Austin, TX 78720, (800) 527-3500. Mac, IBM.

NEC Technologies, Inc., 1255 Michael Dr., Wood Dale, IL 60191, (800) 366-3632. Mac, IBM.

Panasonic, 200 S. Broad St., Philadelphia, PA 19102, (800) 742-8086. Mac, IBM.

QMS-PS 410, $2,795; QMS-PS 810, $4,995; Turbo, etc.; QMS, Inc., 1 Magnum Pass, Mobile, AL 36618, (800) 523-2696, (205) 633-4300. Mac, IBM.

Qume Corp., 500 Yosemite Dr., Milpitas, CA 95035, (408) 942-4000. Mac, IBM.

TurboPS/400, $5495; NewGen Systems Corp., 17580 Newhope St., Fountain Valley, CA 92708, (714) 641-8900. Mac, IBM.

TurboSetter 1000 Plus, $6,995; Raster Devices Direct, 9955 W. 69th St., Eden Prairie, MN 55344, (800) HOT-IRD2, (612) 9414919. Mac, IBM.

VT600P, $16,995; **VT600W,** $22,995; Varityper, Inc., 11 Mt. Pleasant Ave., East Hanover, NJ 07936, (800) 631-8134. Mac, IBM.

Monochrome/Grayscale Monitors

Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, (408) 996-1010. Mac.

ChromaVision; CalComp, 2411 W. LaPalma Ave., Anaheim, CA 92801, (800) 225-2667, (714) 225-2667. Mac, IBM.

E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005, (503) 646-6699. Mac.

Ehman Engineering, Inc., P.O. Box 2126, Evanston, WY 82931, (800) 257-1666. Mac.

DrawingCard GrayVision, $3,195; **DrawingCard ChromaVision Plus,** $8,595; CalComp, 2411 W. LaPalma Ave., Anaheim, CA 92801, (800) 225-2667, (714) 225-2667. Mac, IBM.

L-View Display System, $2,395; **PageView,** $1,299; **SilverView,** $1,999; Sigma Designs, 46501 Landing Pkwy., Fremont, CA 94538, (415) 770-0100. Mac, IBM.

PrselView I, $567; **PixelView II,** $897; Mirror Technologies, 2644 Patton Rd., Roseville, MN 55113, (800) 654-5294, (612) 633-4450. Mac.

Radius Two-Page Display, $1,495 IBM; **Radius Two-Page** Display/GS, $1,495 Mac; Pivot, $1,690; Radius, Inc., 1710 Fortune Dr., SanJose, CA95131, (408) 4341010.

Viking 2, $1,995; **Viking 2 G/S,** $3,090; **Viking 21,** $5,590; **Viking 2400,** $2,595; Moniterm Corp., 5740 Green Circle Dr., Minnetonka, MN 55343, (612) 935-4151. Mac, IBM.

Optical Drives

600MB Erasable Optical, $3,497; Mirror Technologies, 2644 Patton Rd., Roseville, MN 55113, (800) 654-5294, (612) 633-4450. Mac.

Apple CD SC, $899; Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010. Mac.

CDR-35, $599; NEC Technologies, Inc., 1414 Massachusetts Ave., Boxhorough, MA 01719, (800) NEC-INFO. Mac, IBM.

HammerDisk600, $4,995; FWB, Inc., 2040 Polk St., Suite 215, San Francisco, CA 94109, (415) 474-8055. Mac.

Tnfinity Optical Drive, $5,699; Peripheral l.and, Inc., 47421 Bayside Pkwy., Fremont, CA 94538, (800) 288-8754. Mac.

Laserframe, SuperMac Technology, 485 Portrero Ave., Sunnyvale, CA 94086, (408) 245-2202. Mac.

Micronet , 20 Mason, Irvine, CA 92718, (714) 837-6O33. Mac.

PLI CD-ROM Drive, $l,099; Peripheral Land, Inc., 47421 Bayside Pkwy., Fremont, CA 94538, (800) 288-8754. Mac.

RE0-130, Mac, $2,995; **IBM,** $3,195; Pinnacle Micro, 15265 Alton Pkwy., Irvine, CA 92718, (800) 553 7070, (714) 727-3300. Mac, IBM.

Toshiba America Information Systems, Inc., Disk Products Div., 9740 Irvine Blvd., Irvine, CA 92718, (800) 456-3475. Mac, IBM.

Page Layout Software

Avagio , $299.95; Unison World, 1321 Harbor Bay Pkwy.; Alameda, CA 94501 (800) 444-7553. IBM.

Creator, Multi-Ad Services, 1720 W. Detweiller Dr., Peoria, IL 61615-l695, (309)) 692-1530. Mac.

DesignStudio, $795; **Ready,Set,Go! 4.5,** $495; Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, (800) 343-8973, (201) 845-6l00. Mac.

Express Publisher 1.1, $149.95; Power-Up Software Corp., 2929 Campus Dr., San Mateo, CA 94403, (800) 851-2917, (800) 223-1479 in CA. IBM.

Finesse 3.1, $179; Logitech, 6505 Kaiser Dr., Fremont, CA 94555, (800) 231-7717, (415) 795-8500. IBM.

FrameMaker For The Macintosh, $995; Frame Technology, 1010 Rincon Circle, San Jose, CA 95131, (408) 433-3311. Mac.

GEM Desktop Publisher, $299; Digital Research, 75 Garden Ct., Monterey, CA 93940, (800) 443-4200. IBM.

Interleaf Publisher, $999; Interleaf, Inc., 10 Canal Park, Cambridge, MA 02141, (617) 577-9800. Mac, IBM.

PageMaker 4.0 For The Macintosh, $795; **PageMaker For The** PC, $795; Aldus Corp., 411 First Ave. S., Seattle, WA 98104, (800) 333-2538. Mac, IBM.

PFS:First Publisher, $149; Software Publishing Corp., 1901 Landings Dr., Mountain View, CA 94043, (800) 345-2888. IBM.

Publish It!, $395; Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015, (312) 948-9200. Mac, IBM.

QuarkXPress, $795; Quark, Inc., 300 S.Jackson St., Suite 100, Denver, CO 80209, (800) 356-9363, (303) 934-2211. Mac.

RagTime 3, $599; Migrant Software, 313 Iona St., Naberth, PA 19072, (215) 667-9781. Mac.

Springboard Publisher II, $199.95; Springboard Software, 7808 Creekridge Circle, Minneapolis, MN 55435, (800) 445-4780; (612) 944-3915. IBM.

Ventura Publisher, $895; Ventura Software, Inc., 15175 Innovation Dr., San Diego, CA 92128, (800) 822-8221. Mac, IBM.

Paint Software

MacPaint 2.0, $125; Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052, (408) 727-8227. Mac.

PC Paintbrush IV Plus, $199; **Publisher's Paintbrush,** $285; ZSoft Corp., 450 Franklin Rd., Suite 100, Marietta, GA 30067, (404) 428-0008. IBM.

PixelPaint 2.0, $395; **PixelPaint Professional,** $699; SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086, (408) 245-2202. Mac.

Studio/l, $149.95; **Studio/8,** $495.95; Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, (800) 245-4525, (415) 571-7171. Mac.

SuperPaint 2.0, $199; Silicon Beach Software, 9770 Carroll Center Rd., Suite J, San Diego, CA 92126, (619) 695-6956. Mac.

UltraPaint, $199; Deneba Software, 3305 N.W. 74th Ave., Miami, Fl. 33122, (800) 622-6827, (305) 5946965. Mac.

Scanners

Abaton Scan 300/GS, $2,190; Abaton Technology Corp., 48431 Milmont Dr., Fremont, CA 94538, (800) 444-5321. Mac.

Apple Scanner, $1,799; Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, (408) 996-1010. Mac.

Barneyscan CIS 3515, $9,495; Barneyscan Corp., 1125 Atlantic Ave., Alameda, CA 94501, (415) 521-3388. Mac, IBM.

Datacopy GS Plus, $1,995; Xerox Imaging Systems, Inc., 535 Oakmead Pkwy., Sunnyvale, CA 94086, (800) 248-6550, (408) 245-7900. Mac, IBM.

DS-2000, $695; DS-3000, $895; Chinon America, Inc., 660 Maple Ave., Torrance, CA 90503, (800) 441-0222, (213) 533-0274. Mac, IBM.

Eikonix 1412 Slide Scanner, $20,500; **Eikonix 1435 Slide Scanner,** $9,900; Eikonix, 32 Wiggins Ave., Bedford, MA 01730, (508) 670-4100. Mac, IBM.

Handy Scanner 3000 Plus, $359; DFI, 1544 Port St., West Sacramento, CA 95691, (916) 373-1234. IBM.

JX-100 Personal Color Scanner, $995; **JX-300 Personal Color Scanner,** $3,995; **JX450 Professional Color Scanner,** $6,995; **JX-600 Commercial Color Scanner,** $14,995; Sharp Electronics Corp., Sharp Plaza, Mahwah, NJ 07430, (800) BESHARP, (201) 529-9500. Mac.

MacVision Video Digitizer, $499.95; Koala Technologies, Inc., 70 N. Second St., SanJose, CA95113, (408) 287-6311. Mac.

Mars 128 Plus, $399; **Mars 105 Plus,** $349; **Mars 800 Plus,** $459; Marstek, Inc., 17785-A Skypark Circle, Irvine, CA 92714, (714) 833-7740. IBM.

MSF-300Z, $2,695; MSII Sheet-Fed Scanner, $1,495; Microtek Lab, Inc., 680 Knox St., Torrance, CA 90502, (800) 654-4160, (213) 321-2121. Mac, IBM.

Nikon LS-3500, $9,995; Nikon, Inc., 623 Stewart Ave., Garden City, NY 11530, (516) 222-0200. Mac.

ScanJet Plus, $2,190; Hewlett-Packard Company, 19310 Pruneridge Ave., Cupertino, CA 95014, (800) 752-0900. Mac, IBM.

ScanMan Model 32, $499; Logitech, 6505 Kaiser Dr., Fremont, CA94555, (800) 231-7717, (415) 795-8500. Mac, IBM.

Scanmaster, $6,995; **Scanmaster II,** $4,995; **Scanmaster 35,** $6,995; Scanmaster 35 II, $6,995; Howtek, Inc., 21 Park Ave., Hudson, NH 03051, (603) 882-5200. Mac, IBM.

Word Processing Software

Ami, $199; Ami Professional, $495; Samna Corp., 5600 Glenridge Dr., Atlanta, GA 30342, (800) 831-9679. IBM.

Fullwrite Professional, $395; Ashton-Tate, 20101 Hamilton, Ave., Torrance, CA 90502, (213) 329-8000. Mac.

Legacy; NBI, 3450 Mitchell Lane, P.O. Box 9001, Boulder, CO 80301, (303) 444-5710. IBM.

Lotus Manuscript, $495; Lotus Development Corp., 61 Medford St., Somerville, MA 02143, (800) 842-8455. IBM.

MacWrite II, $249; Claris Corp., 5201 Patrick Henry Dr., Santa Clara, CA 95052, (408) 727-8227. Mac.

Microsoft Word For Windows, $495 IBM; **Microsoft Word 4.0,** $395 Mac; Microsoft Corp., 1 Microsoft Way, Redmond, WA 98052, (206) 882-8080.

Nisus 3.0, $395; Paragon Concepts, Inc., 990 Highland Dr., Suite 312, Solana Beach, CA 92075, (800) 922-2993, ext. 300, (619) 481-1477, ext. 300. Mac.

WordPerfect, $395 Mac; **WordPerfect,** $495 IBM; WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057, (801) 225-5000.

WordStar 6.0, $495; **WordStar 2000,** $495; WordStar International, Dept. 258, P.O. Box 900, San Fernando, CA 91341-9000, (800) 227-5609. IBM.

WriteNow 2.2, $199; T/Maker, 1390 Villa St., Mountain View, CA 94041, (415) 962-0195. Mac.

XyWrite 3 Plus, $445; XyQuest, 44 Manning Rd., Billerica, MA 01821 (508) 671-0888. IBM.